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Tackling the complexities of geographically distributed development with the IBM Software Development Platform

Highlights

■ *Mitigates project failure by pro-viding tools to clearly communicate project require-ments and architecture*

■ *Provides project metrics detailing project status and problem areas that might delay project delivery*

■ *Secures and manages assets during project development and protects assets upon project completion*

■ *Supports parallel geographically dispersed development for a 24x7 development model*

■ *Facilitates precise workflow details, eliminating work transfer issues*

■ *Integrates asset traceability as permitted by network architectures*

■ *Bridges the cultural and commu-nication gap across geographies by automating key processes*

Explore the landscape of geographically distributed development

In today's global economy, many companies have begun shifting from a localized development staffing structure to one that is geographically distributed—across town, across the border or overseas. Some companies are engaged in distributed development within their company boundaries, which may involve multiple sites in a single software development project or service suppliers (outsource providers) that assume all or part of the software development life cycle. Several business drivers contribute to the growth of geographically distributed development:

- *Mergers and acquisitions that lead to teams being dispersed throughout the world*
- *A decision to leverage a variable staffing model that provides flexibility to add or remove people quickly without the penalties and costs associated with hiring, reassigning and laying off staff, in addition to accessing talent that may not be needed full time within the organization or that may not be available locally*
- *Decreased time to market on critical projects such as customer-facing applications or internal applications that affect time-sensitive transaction processing*
- *Leaner budgets and competitive pressure for low-cost solutions requiring cost reductions*

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As companies move to a geographically distributed development (GDD) model, they face new challenges when working with a dispersed team that include language and cultural differences, knowledge- and work-transfer issues, conflicting in-house processes, time-zone differences, and ownership of software artifacts—all complicated by the need to manage change and assets across geographic boundaries in a secure environment.

Affecting all dimensions of the GDD life cycle, language and cultural differences challenge a project manager's ability to clearly state project requirements and system functionality and to communicate architectural design and process flow so that all team members understand project requirements, thereby ensuring that the right application is developed. Knowledge- and work-transfer methods that may be routine in a colocated work environment can no longer be taken for granted. Does each GDD team member clearly understand the scope of the project,

individual responsibilities and how to communicate work status and detailed data relating to the next task? Is there a standard unified process that provides best practices and consistent process guidelines? Managing change and assets so that teams can develop and integrate software changes across all locations in a seamless environment becomes equally complicated. And what about managing your project portfolio, do you have clear insight into all dimensions of every project - do you have project schedules, financial, resource and metric details captured so that you can make informed business decisions on each project?

To address these challenges, companies are once again turning to their software development environment. The IBM Software Development Platform provides a life-cycle solution that knows no boundaries. It can help distributed teams communicate, develop and manage software projects effectively by optimizing the internal infrastructure to help assure project success using industry-proven best practices and tools.

Understand, balance and access the benefits and risks of a GDD project
Planning, managing and aligning IT projects and investments with business goals is the first step to a successful GDD implementation strategy. Visibility into your portfolio to align projects, resources and priorities and the ability to perform ROI, payback or breakeven analyses help to provide the guidance and structure needed to effectively coordinate which projects are best suited for a GDD strategy.

IBM Rational Portfolio Manager automates portfolio and project management with the framework to help you move GDD ideas and initiatives into measurable programs and projects. Rational Portfolio Manager captures project and proposal scope, schedule, financial and resource details helping project managers to visualize and set the desired investment balance of projects and people. Helping the entire organization to remain synchronized with the strategic objectives.

Ensure team communication and collaboration with an established process

Members of distributed teams frequently represent diverse language groups, cultures and time zones. If not properly understood and managed, these factors can lead to miscommunication on many levels—from how to establish project requirements to how to transfer defect data when a bug has been fixed.

Critical to a distributed team's success throughout the development life cycle are highly repeatable processes and standard ways of execution that provide a common vocabulary and clear definition of responsibilities. The IBM Rational Unified Process® methodology, or RUP®, is a software development process framework based on proven best practices. It offers valuable guidance and common processes throughout the full development life cycle. By combining best practices from many disciplines— such as project management, business modeling, requirements management, analysis, design, testing and change management—into one consistent, comprehensive process, RUP promotes a common vision and culture throughout the development

organization. This approach helps to strengthen the relationship between dispersed sites by providing online documentation of project-specific process information. This shared process also improves team communication, enabling development teams to collaborate effectively, work more efficiently and decrease time to market. The comprehensive IT methods, planning and estimation tools of the IBM Rational® SUMMIT Ascendant™ process solution complement RUP guidance for developing quality applications. Engineered as a Web-based solution, RUP extends easily to support your development team at all locations

Mitigate risk through well-defined requirements

Poorly established and poorly defined requirements are often the primary reasons for project failure in a distributed environment. Verbal communication or loosely defined requirements used as a foundation for project development can lead to bad assumptions, errors and ultimately the wrong solution. Diverse cultures present communication challenges; therefore, anything other than concise and clearly defined and documented requirements will likely lead to unexpected and costly results.

IBM Rational RequisitePro® software, a powerful and easy-to-use requirements management solution, provides an effective requirements management process based on the combined power of a database and the freedom of Microsoft® Word. Word documents used for recording requirements provide context or supplementary requirement information. To assign attributes such as priority, difficulty and status as well as to organize and track requirements, Rational RequisitePro uses a database.

To easily establish and analyze the impact of change, related requirements can be linked so that, as changes occur to one requirement, it is easy to see the impact on other related requirements. Having real-time visibility of change lets you pinpoint its effect across the project helping you to make quick, informed decisions for scope management or resource reallocation. Teams can have a requirements solution that promotes better communication, enhances team collaboration and reduces project risk. RequisiteWeb software was developed to extend this solution to members at all locations, allowing remote team members to create, view and modify requirements and requirements documents.

Improve communication with visual models

As the saying goes, "A picture is worth a thousand words." This metaphor points the way toward unifying teams who speak different languages and are located throughout the world. The Unified Modeling Language (UML) has become the software development industry's standard notation for software architecture and design. With UML, software professionals can visually model their analysis and design activities in a uniform and consistent manner, so teams have a common approach to communicate and to document a project's architecture and design.

To make UML easy to work with, IBM Rational created Rational Software Modeler and Rational Software Architect - visual modeling and development tools for creating and maintaining UML models that depict project architecture, process flow, logical component relationships and database design. This software also can generate code directly from your models and generate models from your code, which gives you full control over when and how models are synchronized with your code.

Manage your assets with confidence

Having a system in place to manage your assets is critical in a distributed environment. You need an infrastructure that scales with team size and number of locations; you need a solution that provides automatic, reliable replication of software assets between sites, which provides local access to all software assets to support a 24x7 software development work cycle. IBM Rational provides these capabilities through IBM Rational ClearCase MultiSite® asset management solution. ClearCase MultiSite replicates IBM ClearCase® database repositories referred to as versioned object bases (VOBs) and automatically synchronizes changes from one site to another at any desired time interval. With ClearCase MultiSite, project teams have local access to develop and integrate software changes from multiple locations using reliable ClearCase software asset management capabilities. To support parallel development as dictated by a geographically distributed

team, ClearCase MultiSite uses the familiar Rational ClearCase branch-and-merge model capabilities, thus allowing project integration to take place at any site at any time. Additional features provided by Rational ClearCase MultiSite include software ownership, version control, workspace management, build management and process control.

Increase productivity with an efficient and effective workflow

Multiple teams, locations, languages and disciplines equate to mass confusion when work is transferred between disciplines within the development life cycle. Any number of questions can arise: Has development fixed the defect? Has it been passed to quality assurance (QA) for testing? Who has been assigned the latest change request introduced in the triage meeting? Left unanswered, these types of questions can have a significant impact on your project, such as delays in project delivery and poor quality.

"Today, our customized RUP process provides the strong basis we need for technical communication and helps ensure successful completion of offshore development."

Kirti Vaidya
Senior Director
E-Business Covansys
Daksoft

To avoid such a debacle, IBM Rational ClearQuest® MultiSite software, a proven change request management process, often meets the needs of most organizations. It also can be customized for your specific needs. Because its robust, flexible workflow support includes e-mail notification and submission options, your team members can be informed as change requests are updated. You can define unique workflows for any type of change request. To address team members at all locations, automatic synchronization provides distributed teams with up-to-date access to replicated defect and change tracking information so that all members are in synch.

Achieve customer satisfaction with quality releases
One of the best practices embraced by the Rational Unified Process is continuously ensure quality. This practice involves collaboration and communication with the entire development team to create a test plan that covers functional and performance

testing. To address this dimension of the development cycle, IBM Rational provides a comprehensive system testing family—including IBM Rational TestManager to help you administer a complete test plan including manual testing workflows, test logs and automated reports of test execution, as well as IBM Rational Performance Tester and Rational Functional Tester.

Avoid project delay and cost overruns
Determining project status can be an especially daunting task for distributed teams. Cultural differences tend to add complexities; for example, the norm in a given region may be to always assert success, when in reality the project may be weeks behind schedule. For this reason, you should have all project-related data at your fingertips so that you can accurately measure all factors contributing to the success or failure of your project. These factors may include data and indicators such as the number of top priority defects or the number of requirements that have not yet been addressed in the development cycle.

These types of detailed facts can enable you to objectively measure the status and progress of your project without the need to decipher what your team located 10,000 miles away really meant by, "Yes, we're almost on target."

The IBM Rational ProjectConsole™ tool, a capability within the Rational Team Unifying Platform™, collects actual development data from products within the IBM Software Development Platform along with third-party products, presenting the results graphically so that you can easily and quickly assess project progress and quality. This capability allows you to objectively measure and better predict those areas that will require special attention. Rational ProjectConsole helps answer various types of questions: Where should I focus scarce resources in order to stay on schedule? What trends are occurring that could affect cost and schedule? As a Web-based solution, Rational ProjectConsole can help keep your projects on schedule and on budget.

Gain traceability throughout the development life cycle

Product integration within the IBM Software Development Platform provides a powerful mechanism that automates and integrates the business process of software development so that organizations can become more focused, responsive and resilient. A life-cycle integration starts with creating project requirements. Once you have established your requirements in Rational RequisitePro, you can map them directly to your use-case diagrams in Rational Software Modeler so that application development will reflect your requirements design. You also can map project requirements to the test plan created in Rational TestManager, thus verifying that a test case exists for every requirement. Defects that are detected during testing are mapped back to the initial requirements and assigned

to the appropriate development team member. The combination of Rational ClearQuest MultiSite and Rational ClearCase MultiSite enables changes to be tracked throughout the life cycle, providing a complete integration cycle through project development.

To experience the benefits offered by integrations, companies must thoroughly assess their infrastructure, enterprise requirements and development team roles. Once these specifics have been determined, integration and product configuration options can be evaluated to provide the optimal product architecture that works for your unique environment. Some of these options may include products running on a hosted environment, providing Web-based access to shared repositories, as well as reliably replicating and synchronizing those repositories across geographies.

Increase team cohesiveness and responsiveness

Providing users with a virtual team environment gives the group a greater sense of community. An environment where team members can go to tap into the project knowledge base, participate in discussions, access the project calendar and schedule and conduct day-to-day business with each other.

IBM Workplace Collaboration Services provides a family of products, technologies and solutions to support your team environment. An environment delivered in a single customizable portal-like interface helping your team members to coordinate, collaborate and communicate on any project regardless of their location. Having a centralized environment increases responsiveness amoung colleagues, outsource providers and contractors and grants all team members equal opportunity to review and react, thereby alleviating many of the challenges introduce when project members work in different time-zones. Establishing this environment helps group decisions get made faster and keeps all team members involved and up-to-date.

"The use of UML enabled us to document and collaborate more effectively. And, it assisted in knowledge transfer—helping our teams in the U.S. communicate clearly with the development team overseas."

Rajiv Gupta
Vice President of Technology
Thomson Financial – Corporate Group

Obtain support from Rational Services
When undertaking geographically
distributed development, experienced
support can make the difference
between success and failure. Rational
Services can help you accelerate your
distributed initiatives by helping you
define and implement a development
infrastructure and processes that meet
the demands of your organization.

Alone or in combination with Rational
University, Rational Services
can facilitate transition, reduce
risk and maximize the return on
your geographically distributed
development investment.

Visit the following for more information:

Rational GDD solutions: ibm.com/software/rational/solutions/etrans/gdd.html

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